IN THE SPECIFICATION

Please amend the paragraph beginning on page 6, line 15 in the specification as follows:

The controller 8 displays the rear view image captured by the camera 2 on the monitor 4, along with overlapping display of a predicted path 14 for the vehicle 1, shown by the dotted lines in Figs. 3A to 3C. Fig. 3A shows the predicted path 14 when the vehicle moves straight backward. Fig. 3B shows the predicted path 14 when moving backward with the steering angle at the maximum rightward. Fig. 3C shows the predicted path 14 when moving backward with the steering angle at the maximum leftward. The predicted paths 14 have a sideline 17a and a sideline 17b on a screen 15 of the monitor 4. For example, the sidelines 17a and 17b connect line segments 18, 19, and 16, which are equivalent to a width of 1.8 m created by connecting both ends of the rear bumper 3, advancing from the rear bumper 3 of the vehicle 1 by 0.5 m, 1.5 m and 3 m from the current position of the rear axle center. The sidelines 17a and 17b connect both ends of the line segments, and extend as straight lines toward the rear bumper 3, or as smoothly curved lines. The predicted path 14 displayed on the monitor 4 becomes the shape extending straight behind the rear bumper 3 as shown in Fig. 3A when moving backward with the steering wheel 7 in the straight state. When moving backward with the steering wheel 7 turned to the maximum rightward to turn as much as possible, or when moving backward with the steering wheel 7 turned to the maximum leftward ~~rightward~~ to turn as much as possible, the predicted path 14 becomes the shape curved to the rightward direction or to the leftward direction as shown in Fig. 3B and Fig. 3C, respectively.

Please amend the paragraph beginning on page 8, line 19 in the specification as follows:

The vehicle 1 in the vehicle position J1 advances to the vehicle position K1 while turning at the minimum turning radius Rc with the steering angle of the steering wheel 7 at the maximum rightward. In this case, a turning center is assumed to be C3 and a turning angle is assumed to be [[.]] $\underline{\beta}$. In addition, the vehicle 1 in the vehicle position Kl moves backward to the vehicle position Ll while turning at the minimum turning radius Rc with the steering angle at the maximum leftward. In this case, a turning center is assumed to be C4 and a turning angle is assumed to be δ. Moreover, the steering wheel 7 is turned in the opposite direction in the vehicle position Ll and the vehicle 1 moves backward to the vehicle position M1 while turning at the minimum turning radius Rc with the steering angle at the maximum rightward. In this case, a turning center is assumed to be C5 and a turning angle is assumed to be α.

Please amend the paragraph beginning on page 9, line 5 in the specification as follows:

The turning angles α, β and δ have the following relationship:

[[.=.-.]] $\underline{\delta=\alpha-\beta}$.

Please amend the paragraph beginning on page 9, line 11 in the specification as follows:

Coordinates (C4x, C4y) of the turning center C4 are represented by the following expressions:

C4x=C5x + (Rc+Rc) · cos[[.]] $\underline{\alpha}$ = -Rc+2Rc·cos[[.]] $\underline{\alpha}$

C4y=C5y - (Rc+Rc) · sin[[.]] $\underline{\alpha}$ = -2Rc·sin[[.]] $\underline{\alpha}$

Please amend the paragraph beginning on page 9, line 15 in the specification as follows:

Coordinates (C3x, C3y) of the turning center C3 are represented by the following expressions:

$$C3x = C4x - (Rc+Rc)\cdot\cos[[.]]\ \underline{\beta} = -Rc + 2Rc\cdot\cos[[,]]\ \underline{\alpha} - 2Rc\cdot\cos[[.]]\ \underline{\beta}$$

$$C3y = C4y + (Rc+Rc)\cdot\sin[[.]]\ \underline{\beta} = -2Rc\cdot\sin[[.]]\ \underline{\alpha} + 2Rc\cdot\sin[[.]]\ \underline{\beta}$$

Please amend the paragraph beginning on page 9, line 19 in the specification as follows:

In addition, coordinates (J0x, J0y) of the rear axle center J0 of the vehicle position Jl are represented by the following expressions:

$$J0x = -Rc\cdot(1-\cos[[.]]\ \underline{\alpha}) - Rc\cdot(1-\cos[[.]]\ \underline{\alpha} - 1 + \cos[[.]]\ \underline{\beta}) + Rc\cdot(1-\cos[[.]]\ \underline{\beta})$$

$$=2Rc\cdot(\cos[[.]]\ \underline{\alpha} - \cos[[.]]\ \underline{\beta}) \ldots\ldots\ldots\ldots\ldots\ldots (1)$$

$$J0y = -Rc\cdot\sin[[.]]\ \underline{\alpha} - Rc\cdot(\sin[[.]]\ \underline{\alpha} - \sin[[.]]\ \underline{\beta}) + Rc\cdot\sin[[.]]\ \underline{\beta}$$

$$=2Rc\cdot(\sin[[.]]\ \underline{\beta} - \sin[[.]]\ \underline{\alpha}) \ldots\ldots\ldots\ldots\ldots\ldots (2)$$

Please amend the paragraph beginning on page 9, line 26 in the specification as follows:

Here, when the above expressions (1) and (2) are transformed using a formula of the trigonometric functions, the following expressions are obtained:

$$\tan \cancel{(./2+./2)}\underline{(\alpha/2+\beta/2)} = J0x/J0y$$

$$\sin^2 \cancel{(./2-./2)}\underline{(\alpha/2-\beta/2)} = (J0x^2+J0y^2) / (16Rc^2)$$

~~. and .~~ $\underline{\alpha \text{ and } \beta}$ can be calculated using the coordinates (J0x, J0y) of the rear axle center J0.

Please amend the paragraph beginning on page 10, line 28 in the specification as follows:

Here, the path of the rear-right end Q1 of the vehicle 1 is defined as P1, and the path of the rear-left end Q2 is defined as P2. The path Pl is plotted as an arc having a turning angle [[.]] $\underline{\alpha}$ and a radius of Ri from the point Ql (-W2/2, a), with the turning center C5 (-Rc, 0) as its center. On the other hand, the path P2 is plotted as an arc having a turning angle [[.]] $\underline{\alpha}$ and a radius of Ro from the point Q2 (W2/2, a), with the turning center C5 (-Rc, 0) as its center.

Please amend the paragraph beginning on page 15, line 21 in the specification as follows:

Next, the steering wheel 7 is turned to the maximum leftward steering angle and the vehicle 1 which is located at the vehicle position El turns on the radius Rc, as it advances to the turn angle [[.]] $\underline{\theta}$. When the vehicle 1 arrives at the vehicle position F1, the steering wheel 7 is turned to the maximum rightward steering angle and the vehicle 1 turns on the turning radius Rc, as it retreats by the turning angle [[.]] $\underline{\varphi}$. When the vehicle 1 reaches the vehicle position Gl parallel to the parking space T, the steering wheel 7 is returned to the straight position, and the vehicle backs up further to park appropriately in the vehicle position H1 inside the parking space T.

Please amend the paragraph beginning on page 16, line 11 in the specification as follows:

The coordinates (C2x, C2y) of the turning center C2 when turning the vehicle from the vehicle position Fl to the vehicle position Gl are expressed as follows:

C2x = -(Rc+Rc)·sin[[.]] $\underline{\theta}$ + Clx=-2Rc·sin[[.]] $\underline{\theta}$ + L - Wl/2

C2y = (Rc+Rc)·cos[[.]] $\underline{\theta}$ + Cly=2Rc·cos[[.]] $\underline{\theta}$ - (D+Rc)

Please amend the paragraph beginning on page 16, line 19 in the specification as follows:

Based on the two relational expressions for the X coordinate C2x, sin[[.]] $\underline{\theta}$ is expressed as follows:

sin[[.]] $\underline{\theta}$ = (Rc + L - Wl/2)/2Rc

Please amend the paragraph beginning on page 16, line 22 in the specification as follows:

The value of [[.]] $\underline{\theta}$ can be calculated using Rc, L, and W1.

Please amend the paragraph beginning on page 16, line 23 in the specification as follows:

Furthermore, the turning [[angle]] $\underline{\varphi}$ at which the vehicle 1 turns from the vehicle position Fl to the vehicle position Gl is expressed as follows:

[[φ=./2-.]] $\underline{\varphi=\pi/2-\theta}$

Please amend the paragraph beginning on page 16, line 27 in the specification as follows:

Next, the plotting of the predicted path is explained in a case where, as shown in Fig. 9, when the vehicle 1 is positioned at the vehicle position F1, the steering wheel 7 is turned to the maximum leftward and the vehicle turns and retreats from the vehicle position Fl to reach the vehicle position G1. Here, the vehicle 1 at the vehicle position El turns around the turning center C1 on the turning radius Rc at the steering angle of the steering wheel 7 turned to the

maximum rightward, as the vehicle 1 advances to the turning angle [[.]] $\underline{\theta}$. When the vehicle 1 reaches the vehicle position Fl, the vehicle 1 stops and the turning angle of the steering wheel 7 is turned to the maximum leftward, and the vehicle turns around the turning center C2 on the turning radius Rc, as it retreats to the turning angle [[.]] $\underline{\varphi}$. When the vehicle 1 stops at the vehicle position G1 parallel with the parking space T, the steering wheel 7 is returned to the straight position, and the vehicle backs up further to park appropriately inside the parking space T. Note that, the radii from the turning center C2 to the rear-right end and the rear-left end of the vehicle 1 are Ro and Ri, respectively.

Please amend the paragraph beginning on page 17, line 27 in the specification as follows:

Here, the path of the rear-right end Ql of the vehicle 1 is defined as Pl, and the path of the rear-left end Q2 is defined as P2. The path P1 is plotted as an arc having a turning angle [[.]] $\underline{\varphi}$ and a radius of Ro from the point Ql (-W2/2, a), with the turning center C2 (Rc, 0) as its center. On the other hand, the path P2 is plotted as an arc having a turning angle [[.]] $\underline{\varphi}$ and a radius of Ri from the point Q2 (W2/2, a), with the turning center C2 (Rc, 0) as its center.

Please amend the paragraph beginning on page 18, line 26 in the specification as follows:

The controller 8 calculates the yaw angle of the vehicle 1 based on the angular speed of the vehicle 1, which is inputted ~~form~~ from the yaw rate sensor 9, and then compares this yaw rate with the turning angle [[.]] $\underline{\theta}$, which corresponds to a prescribed yaw rate having been set in advance. Similarly to when performing in-line parking, as the vehicle 1 makes its approach from the vehicle position El to the vehicle position F1, the controller 8 provides the

approach information to notify that the vehicle 1 approached the vehicle position Fl and the arrival information to notify that the vehicle 1 arrived at the vehicle position Fl to the driver via the speaker 13, based on the difference between the yaw angle and the turning angle [[.]] $\underline{\theta}$.

Please amend the paragraph beginning on page 22, line 4 in the specification as follows:

Here, the turning center C5 of the ultimate turning paths Pl and P2 from the vehicle position Ll to Ml and the points Q1 and Q2 which are the start points of the paths Pl and P2 are rotated from the turning center C3 and the points Q01 and Q02, respectively, by an angle of -$\underline{\delta}$ [[.]] around the turning center C4.

Please amend the paragraph beginning on page 22, line 9 in the specification as follows:

Therefore, the coordinates (C5x, C5y) of the turning center C5 are expressed as follows:

C5x=(C3x-C4x)·cos[[.]] $\underline{\delta}$+(C3y-C4y)·sin[[.]] $\underline{\delta}$+ C4x

=-2Rc·cos[[.]] $\underline{\delta}$+ Rc

=Rc(1-2·cos[[.]] $\underline{\delta}$)

C5y = -(C3x-C4x)·sin[[.]] $\underline{\delta}$+ (C3y-C4y)·cos[[.]] $\underline{\delta}$+ C4y

=2Rc·sin[[.]] $\underline{\delta}$

Please amend the paragraph beginning on page 22, line 16 in the specification as follows:

Further, the coordinates (Qlx, Qly) of the point Q1 are expressed as follows:

Qlx=(Q0lx-C4x)·cos[[.]] $\underline{\delta}$+ (Q0ly-C4y)·sin[[.]] $\underline{\delta}$+ C4x

=-(W2/2+Rc)·cos[[.]] δ + a·sin[[.]] δ + Rc

Qly=-(Q0lx-C4x)·sin[[.]] δ + (Q01y-C4y)·cos[[.]] δ + C4y

=(W2/2+Rc)·sin[[.]] δ + a·cos[[.]] δ

Please amend the paragraph beginning on page 22, line 22 in the specification as follows:

Further, the coordinates (Q2x, Q2y) of the point Q2 are expressed as follows:

Q2x =(Q02x-C4x)·cos[[.]] δ + (Q02y-C4y)·sin[[·]] δ + C4x

=(W2/2-Rc)·cos[[.]] δ + a·sin[[.]] δ + Rc

Q2y =-(Q02x-C4x)·sin[[.]] δ + (Q02y-C4y)·cos[[.]] δ + C4y

=-(W2/2-Rc)·sin[[.]] δ + a·cos[[.]] δ

Please amend the paragraph beginning on page 22, line 28 in the specification as follows:

From the above calculation, the path of the rear-right end Pl of the vehicle 1 is plotted as an arc having a turning angle [[.]] α and a radius of Ri from the point Ql (Qlx, Qly), with the turning center C5 (C5x, C5y) as its center. On the other hand, the path of the rear-left end P2 is plotted as an arc having a turning angle [[.]] α and a radius of Ro from the point Q2 ~~(Q1x, Q1y)~~ (Q2x, Q2y), with the turning center C5 (C5x, C5y) as its center.

Please amend the paragraph beginning on page 26, line 19 in the specification as follows:

Therefore, Embodiment 4 is configured such that the vehicle mark 21 on the monitor 4 can be moved by the vehicle mark moving unit 26 arranged on the driver seat, and when the vehicle mark 21 displayed at the initial stop position is deviated from the parking space

T, the driver uses the vehicle mark moving unit 26 to move the vehicle mark 21 to align it with the parking space T. Note that the movement by the vehicle mark moving unit 26 includes vertical movement, horizontal movement, and rotation on the monitor 4. Based on the amount of movement by the vehicle mark 21, the controller 8 calculates a gap between the initial stop position where the vehicle actually stopped and the vehicle position J1. Based on the calculated gap and the standard coordinates J0x, J0y of the rear axle center J0, the controller 8 obtains the coordinates (J0x + dx, J0y + dy) of the rear axle center J0' at the actual initial stop position, and adjusts the above-mentioned turning angles [[., . and .]] <u>α, β and δ</u> so that the vehicle 1 can be appropriately [[and]] parked in-line into the parking space T.

Please amend the paragraph beginning on page 27, line 6 in the specification as follows:

Then, the adjusted turning angles [[., . and .]] <u>α, β and δ</u> are used as prescribed yaw angles to create the guidance information, which is sent to the driver. Accordingly, the vehicle 1 can be appropriately parked into the parking space T.

Please amend the paragraph beginning on page 27, line 10 in the specification as follows:

Further, in the case where the vehicle mark moving unit 26 also has the function to rotate the displayed vehicle mark and obtain the angle [[.]] <u>ε</u> formed by the actual initial stop position and the vehicle position J1, the controller can be given a function to generate the guidance information based on the angle [[.]] <u>ε</u>. Thus, the vehicle 1 can be appropriately parked into the parking space T even in a case where the initial stop position is slanted with respect to the target parking space.

Please amend the paragraph beginning on page 30, line 26 in the specification as follows:

By performing the above-mentioned operations, a corresponding horizontal movement distance DX and vertical movement distance DY are determined. Therefore, as shown in Fig. 16, the target turning angles [[., ., and .]] <u>α, β, and δ,</u> which correspond to the predicted parking positions Ma, Mb, and Mc displayed at the vehicle marks 21a, 21b, and 21c, respectively can be calculated.

Please amend the paragraph beginning on page 33, line 2 in the specification as follows:

For example, when the vehicle 1 reaches the vehicle position Kl which is the reverse movement start position when performing in-line parking, the predicted path and the predicted parking position are calculated and displayed as described in Embodiment 2. However, as shown in Fig. 17, if the vehicle starts moving from the position J3 which is shifted by one vehicle width from the calculatory normal initial stop position J1, then, when the driver follows the guidance information and turns the vehicle 1 at an angle [[.]] <u>β</u> while moving the vehicle forward to reach at the vehicle position K3, the vehicle mark indicating the predicted parking position will be displayed at the vehicle position M3 which is not aligned with the target parking space T shown in the background. However, this misalignment only occurs in the width direction of the vehicle 1. It is assumed that the parallel relationship with respect to the road, and the setting in the forward/backward direction, are accurate.

Please amend the paragraph beginning on page 33, line 18 in the specification as follows:

Here, the driver turns on a correction switch (not shown in the figure), making the controller 8 to a correction mode. When the steering angle of the steering wheel 7 is made the maximum rightward and the vehicle 1 is moved forward in this state, the vehicle 1 turns and reaches the vehicle position K4. At this time, the turning angle from the vehicle position J3 is [[.+..]] $\underline{\beta + \Delta\beta}$.

Please amend the paragraph beginning on page 33, line 24 in the specification as follows:

The following formulae are for calculating the turning angles [[. and .]] $\underline{\alpha \text{ and } \beta}$.

J0x=2Rc·(~~cos. cos.~~$\underline{\cos\alpha - \cos\beta}$) . . . . (1)

J0y=2Rc·(~~sin. sin.~~$\underline{\sin\beta - \sin\alpha}$) . . . . (2)

Please amend the paragraph beginning on page 33, line 28 in the specification as follows:

Based on the formulae, the coordinates (J0x' , J0y') of the rear axle center J0 of the vehicle 1 at the vehicle position J3 become as follows, where [[.]] $\underline{\alpha}$' represents the ultimate turning angle corresponding to the turning angle [[.+..]] $\underline{\beta + \Delta\beta}$.

J0x'=2Rc·{cos[[.]] $\underline{\alpha}$'-cos([[.+..]] $\underline{\beta + \Delta\beta}$) }

J0y'=2Rc·{sin([[.+..]] $\underline{\beta + \Delta\beta}$) – sin[[.]] $\underline{\alpha}$'}

Note that, as described above, it is assumed that there is no misalignment in the forward/backward direction at the vehicle position J3. Therefore, the Y coordinate J0y' remains

as J0y without any changes. By executing the above-mentioned formulae, the X coordinate J0x' and the ultimate turning angle [[.]] α' are obtained.

Please amend the paragraph beginning on page 34, line 9 in the specification as follows:

The predicted parking position M3 displayed at the vehicle position K3 is equivalent to the predicted parking position Ml seen from the vehicle position Kl, and corresponds to a position obtained by rotating the position M1 seen from the vehicle position J1, i.e. rotating the vehicle position achieved when the rear axle center coordinates are (-J0x, -J0y) and parallel to the vehicle 1 from the position J3 by an amount equivalent to the angle [[.]] β, around the turning center (-Rc, 0) when moving to the position K1. Therefore, a point of origin is established at the rear axle center when the vehicle 1 is at the vehicle position K3, and a y-axis is taken in the direction rearward therefrom, and an x-axis is taken in a direction perpendicular toward the left. Using this coordinate system, the coordinates (M3x, M3y) of the rear axle center at the predicted parking position M3 are expressed as follows:

M3x (K3) = (-J0x+Rc)·cos[[.]] β + J0y·sin[[.]] β - Rc

M3y (K3) = (-J0x+Rc)·sin[[.]] β - J0y·cos[[.]] β

Note that, the values of J0x and J0y are negative values at this time.

Please amend the paragraph beginning on page 34, line 28 in the specification as follows:

When calculated in a similar manner, if the vehicle position K4 is taken as the point of origin, the following equations express the coordinates (M3x, M3y) of the rear axle

center by use of the above-mentioned J0x' and [[.]] α' when the vehicle 1 is at the predicted parking position M3.

M3x (K4) = (-J0x' +Rc)·cos ([[.+..]] β + Δβ) + J0y·sin ([[.+..]] β + Δβ) -Rc

M3y (K4) = (-J0x'+Rc)·sin([[.+..]] β + Δβ)-J0y·cos([[.+..]] β + Δβ)

Please amend the paragraph beginning on page 35, line 4 in the specification as follows:

When the vehicle 1 reaches the position K4, this position is set as the rear axle center, and the vehicle mark is displayed on the screen 15 in the monitor 4 at the predicted parking position in such a way that the angle made with the vehicle 1 is [[.+..]] β + Δβ. This position appears at a position closer to the side of the road than the M3 position plotted when the vehicle 1 was at the vehicle position K3. If the vehicle 1 continues to move forward, the position approaches the side of the road as the vehicle 1 advances. Finally, the vehicle mark is displayed beyond the side of the road.

Please amend the paragraph beginning on page 35, line 14 in the specification as follows:

The driver makes the vehicle 1 advance or retreat such that the vehicle mark aligns with the target parking space T. In other words, the driver stops the vehicle 1 when appropriately when matching the [[..]] Δβ. The controller 8 calculates the ultimate turning angle [[.]] α' corresponding to the angle [[.+..]] β + Δβ.

Please amend the paragraph beginning on page 35, line 19 in the specification as follows:

At the vehicle position K4, the driver turns the steering angle of the steering wheel 7 in the opposite direction to the maximum leftward and moves the vehicle backward, and then stops the vehicle 1 at a position where the yaw angle of the vehicle 1 becomes [[.]] $\underline{\alpha}$', in accordance with the guidance information from the controller 8. Then, the driver turns the steering angle of the steering wheel 7 in the opposite direction toward the maximum rightward. When the driver stops the vehicle 1 at the position where the yaw angle of the vehicle 1 is 0°, the parking is complete.

Please amend the paragraph beginning on page 35, line 28 in the specification as follows:

Note that, it is also possible to display the vehicle mark [[1]] <u>21</u> showing the predicted parking position at an appropriate time after the vehicle 1 starts to advance from the vehicle position J1, e.g., when the actual turning angle of the vehicle 1 exceeds a predetermined value. In such a case, it is not necessary to operate the correction switch (not shown in the diagram).

Please amend the paragraph beginning on page 36, line 29 in the specification as follows:

In other words, by selecting the turning angle [[.]] $\underline{\theta}$ from the initial stop position to the reverse start position, the predicted parking position can be moved along the sideways direction of the target parking space T. Therefore, if the predicted parking positions are displayed by the vehicle marks for each of the reverse start positions, then the driver can adjust the reverse start position such that the vehicle mark is located in the substantial center of the

target parking space T, so that as a result of subsequent rearward movement, the vehicle 1 is guided to the center of the target parking space T.

Please amend the paragraph beginning on page 37, line 8 in the specification as follows:

If ~~.1, .2, and .3~~ θ1, θ2, and θ3 are established as the turning angles at each of the vehicle positions F1, F2, and F3 which are the reverse start positions from the vehicle position El, then, as shown in Fig. 19, the turning angles for moving the vehicle to the vehicle positions G1, G2, and G3 which are the predicted parking positions from the reverse start positions will be [[. /2-.1, ./2-.2, and ./2-.3]] π/2-θ1, π/2-θ2, and π/2-θ3, respectively. The same method as explained in Embodiment 1 can be used to plot the predicted parking positions and the predicted paths predicted from the initial stop position.

Please amend the paragraph beginning on page 37, line 17 in the specification as follows:

However, the turning angle [[.]] θ changes as the vehicle advances ~~form~~ from the vehicle position El to the reverse start position. Therefore, plotting is continuously conducted in accordance with change of the angle [[.]] θ.